

IN THE CLAIMS:

The following is a complete listing of the claims. This listing replaces all earlier version and listings of the claims.

Claim 1 (currently amended): An image processing apparatus comprising:

a photoelectric conversion unit including a ~~[[pixel]]~~ plurality of pixels; and

a noise correction ~~means for~~ device correcting ~~noises~~ noise in each of a plurality of signals from the plurality of pixels by using the plurality of signals accumulated in each pixel of the plurality of pixels during a plurality of different time periods, respectively ~~signal output from a pixel in accordance with noise information obtained from the pixel during two or more arbitrary different accumulation times .~~

Claim 2 (currently amended): An image processing apparatus according to claim 1, wherein said ~~photoelectric conversion unit includes a plurality of pixels~~ noise correction device calculates noise correction information corresponding to a predetermined accumulation time period by using the plurality of signals accumulated during the plurality of different time periods, respectively, and corrects the noise in each of the plurality of signals from each of the plurality of pixels by using a result of the calculation.

Claim 3 (currently amended): An image processing apparatus according to claim 1, further comprising a storage ~~means for~~ device storing the noise information.

Claim 4 (currently amended): An image processing apparatus according to claim 1, further comprising a counter ~~means for~~ device counting ~~[[the]]~~ an accumulation time period of said photoelectric conversion unit.

Claim 5 (currently amended): An image processing apparatus according to claim 1, wherein said noise correction ~~[[means]]~~ device includes a calculation ~~means for~~ device calculating noise information for noise dependent upon ~~[[the]]~~ an accumulation time period and noise information for noise independent from the accumulation time period, in accordance with the noise information of the pixel obtained during the ~~two or more~~ arbitrary plurality of different accumulation times time periods.

Claim 6 (currently amended): An image processing apparatus according to claim 5, wherein said noise correction ~~[[means]]~~ device calculates a difference between a noise signal dependent upon the accumulation time period in the signal output from the pixel and a noise signal independent from the accumulation time period in the signal output from the pixel.

Claim 7 (currently amended): An image processing apparatus comprising:
a photoelectric conversion unit including a plurality of pixels;
a storage ~~means for~~ device storing noise information of ~~[[the]]~~ each pixel of the plurality of pixels for noise independent from an accumulation time period and noise information of ~~[[the]]~~ each pixel for noise dependent upon the accumulation time period; and

a noise correction ~~means for device~~ correcting ~~noises~~ noise in a signal output from said photoelectric conversion unit ~~in accordance with~~ by using the noise information for the noise independent from the accumulation time period and the noise information for the noise dependent upon the accumulation time period, stored in said storage ~~[[means]]~~ device.

Claim 8 (currently amended): An image processing apparatus according to claim 7, further comprising a counter ~~means for device~~ for counting the accumulation time period of ~~[[the]]~~ each pixel.

Claim 9 (currently amended): An image processing apparatus according to claim 7, wherein said noise correction ~~[[means]]~~ device calculates a difference between a noise signal dependent upon the accumulation time period in the signal output from ~~[[the]]~~ each pixel and a noise signal independent from the accumulation time period in the signal output from ~~[[the]]~~ each pixel.

Claim 10 (currently amended): An automatic focus detecting apparatus comprising:

a photoelectric conversion unit including a plurality of pixels;

a noise correction ~~means for device~~ correcting ~~noises~~ noise in each of a ~~signal output~~ plurality of signals from the pixel ~~in accordance with noise information of the pixel obtained during two or more arbitrary different accumulation times~~ plurality of pixels by using the plurality of signals accumulated in each pixel of the plurality of pixels during a plurality of different time periods, respectively; and

a distance measurement calculation ~~means for device~~ performing a distance measurement calculation in accordance with a signal corrected by said noise correction ~~[[means]] device~~.

Claim 11 (currently amended): An automatic focus detecting apparatus comprising:

a photoelectric conversion unit including a plurality of pixels;

a storage ~~means for device~~ storing noise information of a pixel for noise independent from an accumulation time period and noise information of a pixel for noise dependent upon the accumulation time period;

a noise correction ~~mean for device~~ correcting noise in a signal output from said photoelectric conversion unit ~~in accordance with the respective~~ by using the noise information for the noise independent from the accumulation time period and the noise information for the noise dependent upon the accumulation time period, stored in said storage ~~[[means]] device~~; and

a distance measurement calculation ~~means for device~~ performing a distance measurement calculation in accordance with a signal corrected by said noise correction ~~[[means]] device~~.

Claims 12-14 (canceled)

Claim 15 (currently amended): A noise correction method comprising the step of correction ~~noises from noise in each of a signal output~~ plurality of signals from a ~~[[pixel]] plurality of pixels included~~ in a photoelectric conversion unit ~~, in accordance with noise~~

~~information of the pixel obtained during two or more arbitrary different accumulation times~~
by using the plurality of signals accumulated in each pixel of the plurality of pixels during a
plurality of different time periods, respectively.

Claim 16 (currently amended): A noise correction method according to claim 15, further comprising the steps of:

calculating noise information for noise dependent upon ~~[[the]]~~ an
accumulation time period and noise information for noise independent from the accumulation
time period, in accordance with the noise information of the pixel obtained during the ~~two or~~
~~more arbitrary~~ plurality of different accumulation times time periods; and

calculating a difference between a noise signal dependent upon the
accumulation time period in the signal output from the pixel and a noise signal independent
from the accumulation time period in the signal output from the pixel.

Claim 17 (currently amended): A storage medium storing a program comprising
~~the step of code for correcting noises from noise in each of a signal output~~ plurality of signals
from a ~~[[pixel]]~~ plurality of pixels included in a photoelectric conversion unit; ~~in accordance~~
~~with noise information of the pixel obtained during two or more arbitrary different~~
~~accumulation times~~ by using the plurality of signals accumulated in each pixel of the plurality
of pixels during a plurality of different time periods, respectively.

Claim 18 (currently amended): A storage medium storing a program according
to claim 17, further comprising ~~the steps of~~:

code for calculating noise information for noise dependent upon the accumulation time period and noise information for noise independent from the accumulation time period, in accordance with the noise information of the pixel obtained during the ~~two or more arbitrary~~ plurality of different accumulation times time periods; and

code for calculating a difference between a noise signal dependent upon the accumulation time period in the signal output from the pixel and a noise signal independent from the accumulation time period in the signal output from the pixel.